

# NASA TECH BRIEF

## *Marshall Space Flight Center*



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

### Aircraft Communication Via Telefacsimile System

Ground control communications to aircraft in the vicinity of large airports is a major problem. These problems are increasing with the progressive growth of air traffic. Present communications, being largely voice, are subject to misinterpretation, misunderstanding, and interference to an intolerable degree.

The advancement of electronic components is at a point where telefacsimile systems are now feasible. Such a system, providing a written and pictorial means of communicating with approaching aircraft, would lessen the work load on ground control crews.

This system would use as low a bandwidth as possible to avoid overcrowding, while furnishing data as fast as it can be absorbed by the pilot. The proposed system is based on a reading rate of between 500-1000 words/minute, transmitting typewritten matter only. At a rate of 34 lines/second, 200 lines/inch will provide full scale (1:1) typewritten matter at 10 inches/minute, which meets the criteria of the system and is readable. Bandwidth requirements based on 8 inch wide lines of written matter are less than 150 kHz, a considerable saving over conventional television.

A conventional flying spot scanner, moving from left to right at uniform rate, scans materials repetitively; the material moving forward one line space between scans. A mechanical feed, based on a stepping motor-drive, will accomplish this using the spot scanner retrace pulse to trigger each step. The output signal is a line of video carrying a synchronizing pulse at the end of each line.

There is automatic synchronization to any portion of any signal transmitted, either the top, middle, or bottom of a page; however, elaborate synchronization schemes, used in television, are not required.

The receiver is connected to a cathode ray tube, designed to produce a single, high intensity modulated line. The line "writes" on a strip of sensitized paper or plastic, of which several varieties are suitable. The strip is fed over the face of the cathode ray tube by a stepping motor drive, duplicating the scanner drive mechanism. The synchronizing pulse at the end of each line of video is used to trigger the stepping motor.

#### Note:

Requests for further information may be directed to:  
Technology Utilization Officer  
Code A & TS-TU  
NASA - MSFC  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B72-10139

#### Patent Status:

No patent action is contemplated by NASA.

Source: R. L. Brown, Sr. of  
Marshall Space Flight Center  
(MFS-20839)